Saskatchewan Agriculture, Food and Rural Revitalization

Crop Planning Guide 2003

BROWN SOIL ZONE

The following crop budgets are intended to serve as a guide to estimate the income and cost for different crops on summer fallow and stubble. Budgets are included for crops seeded on fallow and stubble land using conventional tillage seeding practices, and for crops seeded on stubble land using direct seeding. These estimates do not represent provincial average cost of production figures.

The figures provide an estimate of variable expenses and other expenses (depreciation and investment cost for machinery, buildings and land). The grain prices are farm gate price estimates for 2003 crop production based on the information that was available December 2002.

On each farm, costs and yields differ due to soil type, climatic conditions and agronomic practices. Farm managers should determine their own costs, yields and expected commodity prices and adjust or change the assumptions listed on the back of this publication.

Large variations in yields and costs do exist between producers. Use these budgeting figures as a guide to develop estimates for your own farm. Your past farm records, adjusted for expected changes in 2003, can be used to develop your own budgeting figures. Blank worksheets are provided for this purpose.

Using the guide

When comparing returns per acre of a continuous-stubble crop to a fallow-seeded crop, you must add the summer fallow costs to the fallow-seeded crop expenses. The best way of comparing summer fallow and stubble crops is to calculate the average returns per rotation acre for different rotations of crops. Refer to the example in this guide.

The break-even yields per acre show the level of yields producers would need to achieve to cover costs in 2003, based on the estimated market price. The break-even prices for crops show the levels of prices needed by producers to cover costs in 2003, if the estimated average yields are obtained.

The net returns and break-even prices and yields in this report are very sensitive to the estimated yields and prices used. Farm managers are advised to interpret these figures very carefully and evaluate new information as it becomes available. Using management tools such as crop insurance and forward pricing reduce the risk of fluctuations in these factors.

Maximizing profitability

These crop budgets can be used to assist producers in deciding which crops will be the most profitable for the coming year or in deciding which crop rotations and farming practices may be the most profitable for the farm over the long term.

Short-term planning

Deciding which crops to grow this coming year can be made by comparing **return over variable expenses** (estimated gross revenue minus variable expenses). Deciding which crop to grow in any one year must also take into account a number of production factors.

For more information on this pick up a copy of *Cropping Decisions*, available from Rural Service Centres.

Long-term planning

When looking at long-term decisions such as crop rotations, direct seeding and continuous cropping, you must look at all costs, including fixed costs. The **return over total expenses** should be the basis of comparison between alternatives.

Switching to a longer crop rotation or direct seeding and/or continuous cropping will likely require a change in farm machinery. Before making these changes, the **return over all costs** needs to be considered.

CROP PRODUCTION COSTS ($/ACRE) BROWN SOIL ZONE

	Summerfallow		Fallow Seeded Crops									
	Tillage Fallow	Chem Fallow	Spring Wheat	Durum Wheat	CPS Wheat	Feed Barley	Oats	Flax	Lentil	Canary Seed	Mustard	Spring Wheat
REVENUE PER ACRE												
Estimated Yield (bu/ac,lb/ac) (A)			33.5	34.9	41.4	53.5	54.5	18.4	1245.0	1001.4	19.1	24.8
Est. On Farm Market Price/bus,lb (B)			5.55	5.73	4.66	2.93	2.50	8.15	0.20	0.20	10.00	5.55
Estimated Gross Revenue/ac (AxB) (C)	**0.00**	**0.00**	**185.93**	**199.98**	**192.92**	**156.76**	**136.25**	**149.96**	**249.00**	**200.28**	**191.00**	**137.64**
EXPENSES PER ACRE												
Variable Expenses/acre												
Seed			10.01	11.15	9.56	6.86	8.98	6.90	33.30	15.40	5.10	10.01
Fertilizer - Nitrogen			6.00	6.00	6.00	6.00	6.00	6.00	1.80	6.00	6.00	13.50
- Phosphorus			5.20	5.20	5.20	5.20	5.20	5.20	6.50	5.20	5.20	5.20
- Sulphur & Other			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.90	0.00
Chemical - Herbicides	2.45	12.10	10.23	10.23	10.23	10.33	6.72	19.89	32.75	11.14	16.75	10.23
- Insecticides/Fungicides	0.00	0.00	1.03	1.03	1.03	0.00	0.00	0.00	2.02	1.15	0.39	1.03
- Others	0.00	0.00	2.42	2.73	2.73	2.52	2.04	0.90	1.80	1.05	7.30	2.42
Machinery Operating - Fuel	4.70	0.94	7.99	7.99	7.99	7.99	7.99	8.93	8.93	7.99	8.46	9.40
- Repair	2.45	1.75	7.20	7.20	7.20	7.20	7.20	8.64	10.74	7.20	7.20	7.20
Custom Work & Hired Labour	0.00	0.00	5.00	5.00	5.00	4.00	4.00	4.00	3.00	4.00	3.50	5.00
Crop Insurance Premium	0.00	0.00	3.50	4.00	5.02	4.99	3.92	6.59	10.48	7.28	6.04	2.59
Utilities & Miscellaneous	2.87	2.87	2.87	2.87	2.87	2.87	2.87	2.87	2.87	2.87	2.87	2.87
Interest on Variable Expenses	0.97	1.38	1.60	1.65	1.63	1.51	1.43	1.82	2.97	1.80	1.86	1.81
Total Variable Expenses (D)	**13.44**	**19.03**	**63.04**	**65.05**	**64.46**	**59.46**	**56.35**	**71.74**	**117.16**	**71.09**	**73.57**	**71.25**
Other Expenses/acre												
Building Repair	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Property Taxes	4.24	4.24	4.24	4.24	4.24	4.24	4.24	4.24	4.24	4.24	4.24	4.24
Insurance & Licences	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18
Machinery Depreciation	4.90	3.50	14.40	14.40	14.40	14.40	14.40	14.40	17.90	14.40	14.40	14.40
Building Depreciation	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Machinery Investment	2.55	1.82	7.49	7.49	7.49	7.49	7.49	7.49	9.31	7.49	7.49	7.49
Building Investment	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Land Investment	13.95	13.95	13.95	13.95	13.95	13.95	13.95	13.95	13.95	13.95	13.95	13.95
Total Other Expenses (E)	**29.55**	**27.43**	**43.99**	**43.99**	**43.99**	**43.99**	**43.99**	**43.99**	**49.31**	**43.99**	**43.99**	**43.99**
Labour and Management (F)*												
Total Expenses (D+E+F) (G)	**43.00**	**46.46**	**107.03**	**109.05**	**108.45**	**103.46**	**100.34**	**115.73**	**166.48**	**115.08**	**117.56**	**115.24**
RETURNS PER ACRE												
Return over Variable Expenses (C-D)	**-13.44**	**-19.03**	**122.89**	**134.92**	**128.47**	**97.29**	**79.90**	**78.22**	**131.84**	**129.19**	**117.43**	**66.39**
Return over Total Expenses (C-G)	**-43.00**	**-46.46**	**78.89**	**90.93**	**84.47**	**53.30**	**35.91**	**34.23**	**82.52**	**85.20**	**73.44**	**22.40**
BREAK-EVEN YIELD PER ACRE **												
To Cover Variable Expenses			**13.8**	**13.7**	**16.7**	**24.9**	**27.9**	**10.5**	**653.0**	**422.7**	**8.7**	**12.8**
To Cover Total Expenses			**27.0**	**26.5**	**32.5**	**50.0**	**57.3**	**19.3**	**1047.4**	**790.4**	**16.1**	**20.8**
BREAK-EVEN PRICE PER BUS/LB **												
To Cover Variable Expenses			**2.28**	**2.25**	**1.88**	**1.36**	**1.28**	**4.63**	**0.10**	**0.08**	**4.56**	**2.87**
To Cover Total Expenses			**4.48**	**4.36**	**3.66**	**2.74**	**2.63**	**8.63**	**0.17**	**0.16**	**8.41**	**4.65**

* These budgets do not include an estimate for owner/operator labour and management. This value varies greatly and depends on both the farm manager's needs as well as the ability of the farm business to generate income. Farm managers need to determine their own actual labour and management costs add it to total expenses.

** The break even yields and prices for summerfallow crops include the previous years tillage fallow expenses.

2003

Conventional Seeded Stubble Crops								Direct Seeded Stubble Crops								
Durum Wheat	CPS Wheat	Feed Barley	Oats	Flax	Lentil	Canary Seed	Mustard	Spring Wheat	Durum Wheat	CPS Wheat	Feed Barley	Oats	Flax	Lentil	Canary Seed	Mustard
25.4	28.1	38.8	41.9	14.1	1032.0	573.0	15.8	24.8	25.4	28.1	38.8	41.9	14.1	1032.0	573.0	15.8
5.73	4.66	2.93	2.50	8.15	0.20	0.20	10.00	5.55	5.73	4.66	2.93	2.50	8.15	0.20	0.20	10.00
145.54	**130.95**	**113.68**	**104.75**	**114.92**	**206.40**	**114.60**	**158.00**	**137.64**	**145.54**	**130.95**	**113.68**	**104.75**	**114.92**	**206.40**	**114.60**	**158.00**
11.15	9.56	6.86	8.98	6.90	33.30	15.40	5.10	10.01	11.15	9.56	6.86	8.98	6.90	33.30	15.40	5.10
13.50	13.50	13.50	13.50	13.50	1.80	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	1.80	13.50	13.50
5.20	5.20	5.20	5.20	5.20	6.50	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20	6.50	5.20	5.20
0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.90
10.23	10.23	10.33	6.72	19.89	32.75	11.09	16.75	13.58	13.58	13.58	13.67	10.06	23.24	36.09	14.49	15.87
1.03	1.03	0.00	0.00	0.00	2.02	1.15	0.39	1.03	1.03	1.03	0.00	0.00	0.00	2.02	1.15	0.39
2.73	2.73	2.52	2.04	0.90	1.80	1.05	7.30	2.42	2.73	2.73	2.52	2.04	0.90	1.80	1.05	7.30
9.40	9.40	9.40	9.40	10.34	10.34	9.40	9.87	6.58	6.58	6.58	6.58	6.58	7.52	7.52	6.58	7.05
7.20	7.20	7.20	7.20	8.64	10.74	7.20	7.20	6.05	6.05	6.05	6.05	6.05	7.26	9.36	6.05	6.05
5.00	5.00	4.00	4.00	4.00	3.00	4.00	3.50	5.00	5.00	5.00	4.00	4.00	4.00	3.00	4.00	3.50
2.91	3.47	3.62	3.02	5.10	8.63	4.15	4.19	2.59	2.91	3.47	3.62	3.02	5.10	8.63	4.15	4.19
2.87	2.87	2.87	2.87	2.87	2.87	2.87	2.87	2.87	2.87	2.87	2.87	2.87	2.87	2.87	2.87	2.87
1.85	1.82	1.70	1.64	2.01	2.96	1.95	2.05	1.79	1.84	1.81	1.69	1.62	1.99	2.94	1.94	1.92
73.08	**72.01**	**67.20**	**64.57**	**79.35**	**116.71**	**76.96**	**80.81**	**70.60**	**72.43**	**71.37**	**66.55**	**63.92**	**78.47**	**115.83**	**76.38**	**75.84**
0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
4.24	4.24	4.24	4.24	4.24	4.24	4.24	4.24	4.24	4.24	4.24	4.24	4.24	4.24	4.24	4.24	4.24
1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18
14.40	14.40	14.40	14.40	14.40	17.90	14.40	14.40	12.10	12.10	12.10	12.10	12.10	12.10	15.60	12.10	12.10
0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
7.49	7.49	7.49	7.49	7.49	9.31	7.49	7.49	6.29	6.29	6.29	6.29	6.29	6.29	8.11	6.29	6.29
0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
13.95	13.95	13.95	13.95	13.95	13.95	13.95	13.95	13.95	13.95	13.95	13.95	13.95	13.95	13.95	13.95	13.95
43.99	**43.99**	**43.99**	**43.99**	**43.99**	**49.31**	**43.99**	**43.99**	**40.50**	**40.50**	**40.50**	**40.50**	**40.50**	**40.50**	**45.82**	**40.50**	**40.50**
117.07	**116.00**	**111.19**	**108.56**	**123.35**	**166.02**	**120.95**	**124.80**	**111.10**	**112.93**	**111.86**	**107.05**	**104.42**	**118.97**	**161.65**	**116.87**	**116.34**
72.47	**58.94**	**46.49**	**40.18**	**35.56**	**89.69**	**37.64**	**77.19**	**67.04**	**73.11**	**59.58**	**47.13**	**40.83**	**36.44**	**90.57**	**38.22**	**82.16**
28.47	**14.94**	**2.49**	**-3.81**	**-8.43**	**40.38**	**-6.35**	**33.20**	**26.54**	**32.61**	**19.08**	**6.63**	**0.33**	**-4.06**	**44.75**	**-2.27**	**41.66**
12.8	**15.5**	**22.9**	**25.8**	**9.7**	**583.6**	**384.8**	**8.1**	**12.7**	**12.6**	**15.3**	**22.7**	**25.6**	**9.6**	**579.2**	**381.9**	**7.6**
20.4	**24.9**	**37.9**	**43.4**	**15.1**	**830.1**	**604.8**	**12.5**	**20.0**	**19.7**	**24.0**	**36.5**	**41.8**	**14.6**	**808.2**	**584.4**	**11.6**
2.88	**2.56**	**1.73**	**1.54**	**5.63**	**0.11**	**0.13**	**5.11**	**2.85**	**2.85**	**2.54**	**1.72**	**1.53**	**5.57**	**0.11**	**0.13**	**4.80**
4.61	**4.13**	**2.87**	**2.59**	**8.75**	**0.16**	**0.21**	**7.90**	**4.48**	**4.45**	**3.98**	**2.76**	**2.49**	**8.44**	**0.16**	**0.20**	**7.36**

For more information, contact your Extension Agrologist or

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BROWN SOIL ZONE ASSUMPTIONS

1. **Seed including cleaning:**

- Spring wheat 1.15 bu/ac at $8.70/bu
- Durum wheat 1.3 bu/ac at $8.58/bu
- CPS wheat 1.3 bu/ac at $7.35/bu
- Barley 1.5 bu/ac at $4.57/bu
- Oats 2 bu/ac at $4.49/bu
- Mustard 10 lb/ac at $0.51/lb
- Flax 30 lb/ac at $13.05/bu ($.23/lb)
- Lentils 90 lb/ac at $0.37/lb
- Canary seed 35 lb/ac at $0.44/lb
- Seed prices are an average of seed grower price and commercial prices since farmers commonly clean their own grain for seed (except for mustard).

2. **Fertilizer:**

Nitrogen based on 46-0-0 at $303/tonne ($.30 N/lb)

- Nitrogen on fallow crops 20 lb N/ac
- Nitrogen on stubble crops 45 lb N/ac
- Nitrogen on fallow and stubble lentils 6 lb N/ac based on 50 lb of 12-51-0

Phosphorus based on 12-51-0 $370/tonne ($.26 P/lb)

- Phosphorus on all crops at 20 lb P/ac except lentils where 25 lb P/ac is the rate used.

Sulphur based on 20-0-0-24 at $291/tonne ($.29 S/lb)

- Sulphur on mustard at 10 lb S/acre (application cost is included with machinery costs).

3. **Pesticides**:

Herbicides:

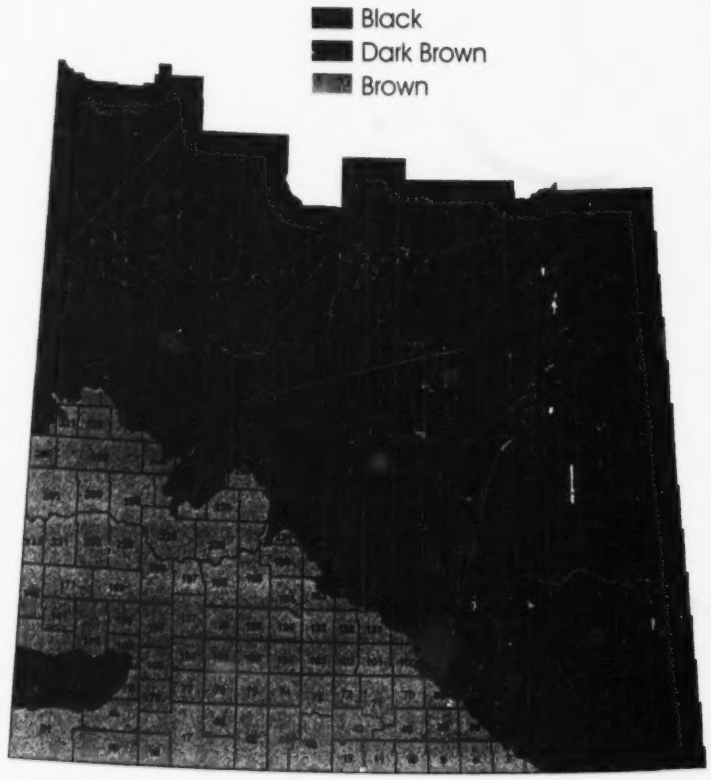
- Cereals: 25% of acres sprayed for wild oats (except oats) and 100% for broadleaf weeds
- Mustard fallow and conventional stubble: wild oats and broadleaf pre-plant 100%. Mustard direct seed: 100% for wild oats.
- Lentils, flax: broadleaf and grassy weeds 100%.
- Canary seed: wild oats 25%, broadleaf 100%.
- Direct seeded stubble: pre plant burn-off 100% (glyphosate)
- Cereals, flax, canary seed: pre/post harvest 20% of all acres with glyphosate.

Others:

- All crops: seed treatment or inoculation 100%
- Canary: insect control 20%
- Mustard: insect control 10% crop/year (10% of $5/ac aerial application cost included in custom work)
- Spring wheat, durum and CPS wheat: midge control 20% crop /year (20% of $5/ac aerial application cost included in custom work)
- Lentils: 100% inoculation, dessication. Fungicide 20% crop/year
- Tillage fallow: winter annuals 100%
- Chem-fallow: 100% winter annuals, two broad spectrum burn-offs, one broad leaf.

4. **Operating costs** are based on recommended production practices in the Brown Soil Zone.
5. **Fuel costs** are based on estimated fuel consumptions for the various farming operations with diesel fuel priced at 47 cents per litre.
6. **Machinery repair** rates are 6% of machinery investment per year for lentils and flax and 5% for all other crops.
7. **Saskatchewan Crop Insurance** premiums are based on coverage at 70% of Risk Area(s) average yield plus 20%.
8. **Building repair** rates are 5% of building investment per acre.
9. **Operating interest** is calculated on all cash operating costs at 5.2% for six months on all crops, 18 months for fallow.
10. **Machinery Depreciation** is calculated at 10% of machinery investment per year on a straight-line basis.
11. **Building depreciation** is based on a building investment of $18 per cultivated acre calculated at 5% per year on a straight line basis.
12. **Average machinery investment** is $144 per cultivated acre, $49 per tillage fallow acre and $35 per chem fallow acre. An additional machinery investment of $35 per acre is assumed for lentils. Machinery investment for direct seeded crops is reduced by $23 per seeded acre.
13. **Investment cost** on building and machinery investment is calculated at an interest rate of 5.2% on the investment per acre.
14. **Land investment cost** of $13.95/ac is calculated at 4.5% return on investment of $310 per cultivated acre.
15. **Crop prices** for 2003 production are farmgate price estimates for 2003 crop production, provided by Saskatchewan Agriculture, Food and Rural Revitalization in December 2002.
16. **Crop yields** are 120% of 15 year averages for crop insurance risk areas 3 and 10, soil class H based on data compiled by the Saskatchewan Crop Insurance Corporation. Crop yields for the average soil class in the risk area have been increased by 20% to reflect the increased productivity for 2003 over the 15 year average and the higher than average input levels used in these budgets.
17. **Crops** that appear in both the Crop Planning Guides and the Specialty Crop Planning Guide that share the same soil zone and are continuous cropped have their yields averaged between Saskatchewan Agriculture, Food and Rural Revitalization's 10 year averages and Saskatchewan Crop Insurance yields plus 20% values.
18. **Labour and management** - These budgets do not include an estimate for owner/operator labour and management. This value varies greatly and farm managers need to determine their own actual labour and management cost.

Soil Zones of Southern Saskatchewan



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CROP PRODUCTION COSTS MY FARM	USE THIS WORKSHEET TO ADJUST THE CROP BUDGETS TO YOUR FARM			
CROPS				
REVENUE PER ACRE Estimated yield (bushel/acre; lb/acre) X Estimated on-farm market price per bushel or per pound				
A Estimated Gross Revenue per acre				
EXPENSES PER ACRE Variable Expenses per acre				
Seed				
Fertilizer: Nitrogen				
Phosphorus				
Sulphur & Other				
Chemical: Herbicides				
Insecticides/Fungicides				
Others				
Machinery Operating: Fuel				
Repair				
Custom Work & Hired Labour				
Crop Insurance Premium				
Utilities & Miscellaneous				
Interest on Variable Expenses				
B Total Variable Expenses per acre				
Other Expenses per acre				
Building Repair				
Property Taxes				
Insurance & Licences				
Machinery Depreciation				
Building Depreciation				
Machinery Investment				
Building Investment				
Land Investment				
Total Other Expenses				
Labour and Management[1]				
C Total Expenses per acre				
RETURNS PER ACRE				
Return over Variable Expenses (A-B)				
Return over Total Expenses (A-C)				
BREAK-EVEN YIELD PER ACRE (per bushel or per pound)[2]				
To Cover Variable Expenses				
To Cover Total Expenses				
BREAK-EVEN PRICE (per bushel or per pound)[2]				
To Cover Variable Expenses				
To Cover Total Expenses				

[1] These budgets do not include an estimate for owner/operator labour and management. This value varies greatly and depends on both the farm manager's needs as well as the ability of the farm business to generate income. Farm managers need to determine their own actual labour and management cost and add it to total expenses.

[2] The break-even yields and prices for summerfallow crops include the previous years tillage fallow expenses.

USING THE CROP BUDGETS

The relative profitability of crops can be difficult to determine when they are part of a longer-term rotation. Profits are easier to compare based on the net returns per rotation acre, which is the average profit or loss per acre, per year for a particular crop rotation.

Step 1. Adjust the crop budgets for the crops to be compared.

The crop budgets shown in this report are based on estimated costs and returns for each crop. The actual costs and returns on your own farm may be different. For example, the budget for direct seeded stubble canola or mustard assumes the use of a herbicide to control grassy weeds and volunteer grain. You may not have these weeds on the fields you are planning to seed. You may wish to change costs to suit the conditions on your own farm.

Step 2. Calculate the average returns per rotation acre.

Use the table below to list the different rotations of crops and fallow which you are considering for your farm. Show the complete rotation from the first year to the last year. Use the adjusted crop budgets for your own farm to calculate the average return per rotation acre for various rotations.

CROP ROTATION RETURNS	Example 1 BLACK SOIL ZONE			Rotation 1		Rotation 2		Rotation 3	
	Crop	Return over Total Expenses $/acre	Return over Variable Expenses $/acre	Crop	Return $/acre	Crop	Return $/acre	Crop	Return $/acre
Year 1	Canola on Fallow	$57.04	$115.61						
Year 2	Wheat Direct-Seeded	$61.18	$116.26						
Year 3	Lentil Direct-Seeded	$32.32	$92.72						
Year 4	CPS Direct-Seeded	$62.41	$117.49						
Year 5	Tillage Fallow	$(58.53)	($16.68)						
Year 6									
Total Returns		$154.42	$425.40						
Total # of years in rotation		5	5						
Return per rotation acre		$30.88	$85.08						

In this example, both returns over total expenses and returns over variable expenses are calculated.
If the average return is negative then the rotation with the smallest negative return would be best.